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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,575	08/03/2006	David Tsay		8302

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EXAMINER

HANDAL, KAITLY V

ART UNIT	PAPER NUMBER
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1795

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04/15/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/588,575	Applicant(s) TSAY ET AL.
	Examiner KAITY V. HANDAL	Art Unit 1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 16-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/3/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 16-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12/15/2008.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 10-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 recites the limitation "the inner cavity edge and outer shell edge" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: (13). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should

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include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the fuel burner and the heating supplied system comprising a fuel oxidizer or and electric heater or an imported heat stream must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

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Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minet et al. (US 5,229,102) in view of Wachsman et al. (US 6,235,417 B1).

With respect to claim 1 and 6, Minet teaches an apparatus comprising:

(a) a reformation chamber (Fig. 1, 16) including a feed inlet (15) to an interior region of the chamber (16) (as illustrated), a product outlet (illustrated) from the interior region of the chamber (16), and a membrane (11) having a first side in the interior region of the chamber (16) and a second side outside the interior region of the chamber (16) (as illustrated);

(b) a porous layer of a reformation catalyst/nickel (17) effective to catalyze decomposition of the feed to hydrogen supported by and/or adhered to or adjacent to said first side of the membrane which permits diffusion of hydrogen from said first side thereof through the membrane to said second side thereof (col. ; and,

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(c) a collection region or chamber (illustrated at (C)) on the second side of the membrane (11a) (col. 3, lines 55-68).

Minet fails to teach wherein the membrane is a protonic-electron conducting cermet membrane which permits diffusion of ionic hydrogen from said first side thereof through the membrane to said second side thereof where the hydrogen ions can be reconstituted into molecular hydrogen with a supply of electrons. Wachsman teaches providing a is a protonic-electron conducting cermet membrane used in combination with a hydrogen reforming process wherein said cermet membrane permits diffusion of ionic hydrogen from said first side thereof through the membrane to said second side thereof where the hydrogen ions can be reconstituted into molecular hydrogen with a supply of electrons (col. 3, lines 28-54) in order to provide a more economical membrane and one of greater mechanical strength (col. 6, lines 1-4).

It would have been obvious to one having ordinary skill in the art at the time of the invention to replace the membrane in Minet's apparatus with that of Wachsman, in order to provide a more economical membrane and one of greater mechanical strength.

With respect to claim 2, Minet teaches a heating supply system/burners (14) whereby the reformation chamber can be raised to and maintained at a temperature of between about 600 degrees C. to 1000 degrees C. by an integral fuel burner, said heating supply system comprising a fuel oxidizer/burner (14) (as illustrated) (col. 3, lines 55-68).

With respect to claims 2 and 7-8, the claims describe operational conditions and do not limit the invented apparatus. While features of an apparatus may be recited

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either structurally or functionally, claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997), see also *In re Swinehad*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." *Hewlett-packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original). MPEP 2114.

With respect to claim 3, Minet teaches further a pressurizing means/(compressor (Fig. 2, 115)) (col. 5, lines 28-36) whereby a reformation feedstock can be compressed to above ambient pressure (col. 3, lines 61-68).

With respect to claim 4, Wachsman further teaches wherein the protonic-electron conducting cermet material consists essentially of a proton conducting ceramic phase represented generally by the chemical formula ABO_3 wherein: A is selected from the group of metals consisting of the alkaline earth metals and mixtures thereof; B is selected from an element or combination of elements from the periodic table groups of transition metals and metals in combination with an effective amount of an electron conductor metal phase additive consisting essentially of palladium, nickel, cobalt, iron, ruthenium, rhodium, osmium, iridium, platinum, titanium, zirconium, hafnium, vanadium, niobium, tantalum, copper, silver, gold, and mixtures and alloys thereof; and, O is oxygen (col. 3, lines 36-48).

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With respect to claim 5, Wachsman further teaches wherein the metal phase additive/palladium is selected so as to also function as a sintering aid (col. 4, lines 46-50).

With respect to claim 9, Minet teaches further wherein a catalyst-membrane subassembly (11) is encased between a pair of metallic, ceramic or cermet containment shells/(closed metallic tube (13)) in a planar configuration to form a reformation chamber element (col. 3, lines 55-60).

With respect to claim 10, though Minet does not explicitly teach wherein the reformation chamber element includes o-rings, seals, gaskets or brazes to effect sealing at the inner cavity edge and outer shell edge, it would be obvious if not inherent that an apparatus operating at the high temperatures and pressures disclosed by Minet would require having in place the necessary seals and brazes to allow the apparatus to perform; a semi-permeable support region/(membrane (11) is permeable to hydrogen only, therefore it is semi-permeable) with an expansion foil/part of the membrane (11) inside the reformation chamber element (16), and a non-permeable parameter member (13) that includes inlet and/or outlet manifolds (15, 12, D) (as illustrated).

With respect to claim 11, Minet teaches further wherein a plurality of the said reformation chamber (16) elements, each containing a catalyst-membrane subassembly (17 & 11) in the cavity (16), and sealed or adhered to a containment shell (13) to separate the reformation chamber element (16) from a resultant chamber (22) on the second side of the membrane (11), are bonded/coated hermetically to form a stack that is encased by a terminal shell pair (13). Having a plurality of said reformation chamber

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elements is a mere duplication of parts: *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) It has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced). MPEP 2144.06B.

With respect to claims 12-13, Minet teaches further wherein the inlet manifolds (12 and 15) of the reformation chamber elements are hermetically joined to a fuel feed (as illustrated) and the outlet manifolds (D) to a purged exhaust conduit (12a)/(it would be obvious that the apparatus of Minet would be constructed such that all elements are joined hermetically to one another in order to prevent any leaks and thereby enabling the apparatus to maintain the high operational pressures as set forth above.

With respect to claim 14, Minet teaches further including a conduit system whereby a purged reformation stream withdrawn from the reformation chamber elements is diverted to a heating source where it can be combusted to produce heat for the reformation chamber (col. 7, lines 43-53).

With respect to claim 15, Minet teaches further wherein a catalyst-membrane subassembly is encased in a metallic, ceramic or cermet containment chamber/(closed metallic tube (13)) (col. 3, lines 55-60) in a tubular configuration (as illustrated).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAITLY V. HANDAL whose telephone number is (571)272-8520. The examiner can normally be reached on M-F 8-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. V. H./
Examiner, Art Unit 1795

4/9/2009

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795